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HOW THE CALIFORNIA DEPARTMENT OF TRANSPORTATION DROVE A RARE FLOWER TO THE EDGE OF EXTINCTION

When it comes to imperiled species, sometimes carelessness kills.

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Early last summer, a maintenance crew with the California Department of Transportation made an extinction-level mistake.

The accident unfolded on a June day along a lonely strip of highway in northern California's Mendocino County. The landscape there is one of rumpled mountains blanketed by coastal scrub or Redwood forests, interlaced with low valleys where farmers and ranchers make their living. It's part working land, part wild backcountry, but above all it's bio-diverse. The region, like much of the rest of the state, is exceedingly rich in unique flora and fauna.

"In terms of biodiversity around the world, California is high on the list," says Dave Imper, the rare plant chair of the California Native Plant Society's North Coast chapter. "And within California, the real biodiversity hotspots are in the northwestern part of the state."

Thanks to its variable topography, Mediterranean climate, and unique soils, California alone boasts some 2,300 endemic plant species, more than any other state in the country. Of these species, many exist in small populations in very particular locations and occur nowhere else on Earth. They're like rare gems sourced from a sole deposit.

The Milo Baker's lupine is one of those gems. A three-foot-tall flower with a sturdy taproot, the lupine is found exclusively in a remote corner of northern California. The annual plant, whose buttery blue-yellow blossoms bloom for a few months in mid-summer, is also extraordinarily scarce. The lupine is designated as threatened under the California Endangered Species Act, and there are only 10 known populations of the flower left on the planet. Of these, just *one* population has actually produced flowers in the last 30 years. That single productive occurrence, approximately 100 flowers in total, lived, until recently, along the shoulder of state Highway 162 near the tiny town of Covelo in Mendocino County.

On June 9th, 2016, a California Department of Transportation, or Caltrans, maintenance team arrived on Highway 162 to conduct regular roadside mowing. In the course of its duties, and despite ample agency documentation of the plant's presence in the area, the crew erred carelessly. With car-sized tractors and twirling blades, it cut down the last-known flowering population of the Milo Baker's lupine.

Gordon Leppig, an environmental scientist with the California Department of Fish and Wildlife, or CDFW, was shocked when he finally heard about the accident. Among his other duties at CDFW, Leppig monitors rare plants around the Mendocino region. The lupine's destruction sent him into crisis mode.

The mowing of the lupine “was an emergency event of grave concern that required immediate action,” he says. “Witnessing a potential extinction event is something no state scientist ever hopes to experience in their career.”

Leppig hit the road as soon as possible. Somehow, somewhere, he hoped to discover remnant lupines scattered among the farms and fields and roadways of Mendocino County. If he failed, his agency would be forced to declare the species functionally extinct.

“My intent,” he says, “was to drive every single road to see if there were any more plants.”

His agency, meanwhile, issued Caltrans a notice of violation of the California Endangered Species Act. In destroying the Milo Baker’s lupine population, Caltrans had harmed a state-listed threatened species and thus broken the law.

The unfortunate incident along Highway 162 was just the latest of the lupine’s troubles. Even before the mowing, the flower had suffered long-term mismanagement at Caltrans’ hands. According to CDFW’s notice of violation, Caltrans herbicide spraying in the 1980s was a significant driver of the species slide toward extinction. In fact, in a 1984 letter to Caltrans, CDFW documented “herbicide induced Milo Baker’s lupine mortality incident” that had wiped out five of the 12 remaining lupine populations then in existence and had severely damaged three others.

In that earlier letter, CDFW also stated that “over 60 percent of the total range of this species has been destroyed by Caltrans herbicide spraying....”

Caltrans says it is not entirely to blame. “While you cannot deny that there have been negative impacts from Caltrans activities this past year, there are multiple pressures the lupine faces and these have not been measured in detail,” writes Jenny Hutchinson, a Caltrans environmental planner, in an email. She mentions, for instance, the role that private landowners have played in eradicating the plants, which are poisonous to livestock.

Other causes, like broad agricultural land uses change in Mendocino County and the state’s devastating drought, also contributed to the catastrophe. Caltrans’ history of herbicide spraying, meanwhile, is merely a more proximate catalyst of the plant’s decline. Together these factors reduced the Milo Baker’s lupine population to such low numbers that a single mowing accident threatened to wipe out the species altogether.

And so, as he spent two days crisscrossing the rural valley where the lupine lived, Leppig was not optimistic. He drove to all 10 of the historic lupine populations in the area and saw not a single flower. He waded into fields and roadside brush, but found nothing. A day-and-a-half passed and Leppig had only a few hours left before he planned to head home.

“I wasn’t feeling that this thing was still in existence,” he says. “I was pretty glum about it.”

Then, not far from the site of the mowing, he spotted something under an oak tree, clambered out of his car, and walked into the woods.

He breathed a huge sigh of relief, he says. Standing before him were 77 Milo Baker’s lupines. “To our knowledge,” Leppig adds, “[they are] the only such lupines left on Earth.”

In September, Leppig returned to the site of the surviving flowers and collected 1,718 of their seeds. Like some sort of anti-extinction superhero, the state scientist from CDFW clawed a species back from extinction’s edge.

Since Leppig’s rear-guard recovery action, the lupine seeds he collected have been sent to a botanical garden for safekeeping and cultivation. His agency teamed up with Caltrans and the local Round Valley Confederated Tribes, meanwhile, to plant some of the seeds in the wild. Caltrans, according to Hutchinson, is also in the process of developing a conservation plan for the lupine.

“There will be closer communication [about rare species] in the future,” Hutchinson says. “Word has spread [about the mowing incident] and people are paying attention.” A few surviving seedlings have even sprouted at the site of the mowing, she adds.

Leppig hopes this sordid incident is cause for reflection and reform at the transportation agency.

“I think it is fair to say that [Caltrans] is an entity that is driven by engineering, not by an emphasis on protecting natural resources,” he says. “It remains to be seen how much effort Caltrans is really ready to put forth to help manage and recover this species.”

Though this saga involves a very rare plant in a small corner of the country, it’s about more than a specific species or the conflicting demands of California’s state agencies. In many ways, it’s emblematic.

On the one hand, it helps remind us that road building can be and often is ecologically devastating. Researchers, writing in Science last month, reported that road building has chopped up the Earth’s land surface into approximately 600,000 chunks, more than half of which are ecologically impoverished due to their small size.

“Roads,” the scientists wrote, “fragment landscapes and trigger human colonization and degradation of ecosystems, to the detriment of biodiversity and ecosystem functions.” Yes, roadside right-of-ways are sometimes the last refuge of rare plants, as Aldo Leopold noted long ago. But roads, the *Science* authors report, are also a driver of “species loss” on a global scale.

On the other hand, the story of the Milo Baker’s lupine clarifies a few crucial aspects of the extinction crisis in general: Human-triggered species eradication often occurs in imperceptible increments over many years. It often takes place away from public view. And it often happens accidentally. It’s a quiet and quotidian affair in which carelessness, too, can be a killer.